

under 35 U.S.C. § 102(b) as being anticipated by David (U.S. Patent 5,496,528) or Wong (U.S. Patent 5,686,368). Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over David or Wong. Claims 1-6 and 30-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yukinobu et al. (U.S. Patent 5,820,643; hereinafter "Yukinobu") or Yamamoto et al. (U.S. Patent 5,132,104; hereinafter "Yamamoto"). Claims 1-4 and 30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamaguchi et al. (U.S. Patent 5,468,697; hereinafter "Yamaguchi"). Claims 1-6 and 30-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Japan 53025229. The Applicants respectfully traverse all of these rejections for the reasons set forth below.

#### **Claim Rejection Under 35 U.S.C. § 112, First Paragraph**

Claims 31 and 32 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. Claim 31 has been canceled. Therefore, the rejection of claim 31 is now moot.

Specifically, the Examiner asserts that "[i]n claims 31, 32 'a cross-sectional dimension greater than about 1  $\mu\text{m}$ ' is new matter" and that "[i]nstant Figures 1, 2 do not support this recitation." The Applicants respectfully traverse this rejection because each of Figures 1 and 2 (and also Figures 3 and 4) has a dimension scale in the upper left-hand corner of each of the photographs. The Applicants submit herewith substitute copies of Figures 1-4 having better quality and clearly showing the same dimension scale. No new matter has been added. Therefore, the limitation "a cross-sectional dimension greater than about 1  $\mu\text{m}$ " is fully supported in the original specification.

#### **Claim Rejection Under 35 U.S.C. § 112, Second Paragraph**

Claims 1-6 and 31-32 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1, 2, and 31 have been canceled. Therefore, the rejection of claims 1, 2, and 31 is now moot. In particular, the Examiner objects to the phrase "of VIIIA of the Periodic Table" in claims 1, 5, 31, and 32 because it is ungrammatical and thus

indefinite. Claims 5 and 32 have been amended to cure the inadvertent error in the use of the first "of", and now overcome the rejection.

**Claim Rejection Under 35 U.S.C. § 102(b)**

Claim 6 is rejected under 35 U.S.C. § 102(b) as being anticipated by David or Wong. The Applicants respectfully traverse this rejection because David or Wong does not disclose each and every element of claim 6.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a *single* prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Neither David nor Wong discloses that their oxide fibers or particulates have a polygonal cross section and have a cross-sectional dimension greater than 1  $\mu\text{m}$ , as is recited in claim 6. In fact, Wong consistently speaks of "fiber diameter." Column 15, lines 31, 49, and 54. Such a characterization of the fiber coupled with the fact that Wong uses organic polymeric fibers (rayon) as the templates for his oxide fibers suggests that these oxide fibers, which are used in textiles, generally have circular cross section.

David discloses dimensions of the needles from 100 to 1000 angstroms (0.01 to 0.1  $\mu\text{m}$ ), most typical around 500 angstroms (or 0.05  $\mu\text{m}$ ). Column 4, lines 66-67. Therefore, David does not disclose a cross-sectional dimension greater than about 1  $\mu\text{m}$ , as recited in claim 6. In addition, David does not disclose expressly or inherently a polygonal cross section, as recited in claim 6.

Since neither David nor Wong discloses each and every element of each of claim 6, neither David nor Wong anticipates this claim.

**Claim Rejection Under 35 U.S.C. § 103(a)**

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over David or Wong. The Applicants respectfully traverse this rejection because neither David nor Wong teaches or suggests all of the elements of claim 6.

"[T]he legal conclusion of obviousness [under 35 U.S.C. § 103(a)] requires that there be some suggestion, motivation, or teaching in the prior art whereby the person of ordinary skill would have selected the components that the inventor selected and used them to make the new device." *C.R. Bard, Inc. v. M3 Systems, Inc.*, 48 U.S.P.Q.2d 1225, 1231 (Fed. Cir. 1998). Thus, in order for the prior art to render the claimed invention obvious, all of the elements thereof must be taught or suggested in the prior art. "What must be found obvious to defeat the patentability of the claimed invention is the claimed combination." *The Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 U.S.P.Q.2d 1923, 1927 (Fed. Cir. 1990).

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." "All words in a claim must be considered in judging the patentability of that claim against the prior art." MPEP § 2143.03 (8<sup>th</sup> Ed., Aug. 2001).

Neither David nor Wong discloses or suggests that their oxide fibers or particulates have a polygonal cross section and a cross-sectional dimension greater than about 1  $\mu\text{m}$ , as is recited in claim 6. In fact, Wong consistently speaks of "fiber diameter." Column 15, line 31, 49, and 54. Such a characterization of the fiber coupled with the fact that Wong uses organic polymeric fibers (rayon) as the templates for his oxide fibers suggests that these oxide fibers generally have circular cross section. Wong's fibers shown in Figures 3 and 4 clearly are not polygonal.

As pointed out above, the dimension of David's needles is in the range from 0.01 to 0.1  $\mu\text{m}$ , which is 10-100 times smaller than the cross-sectional dimension of the claimed acicular bodies.

In addition, the claimed acicular bodies are made by a different process than those of David and Wong. Therefore, it is expected that the claimed acicular bodies would have different structure than the oxides of David or Wong.

In the same opinion of the Court of Appeals that the Examiner cited, the court held that "indirect comparisons, based on established scientific principles, can validly be applied to distinguish a claimed chemical . . . product from that disclosed in the prior art." *In re Best*, 195 U.S.P.Q. 430, 432 (C.C.P.A. 1977).

David made a true rare earth hydroxide by reacting rare earth carboxylic acid salt with a strong base (i.e., a hydroxide of Group IA metal, such as Li, Na, or K). Column 1, lines 53 and 66. In contradistinction, the claimed acicular bodies are made by reacting a metal salt with an organic dicarboxylic ester, which is never a strong base. This reaction would produce a metal dicarboxylic salt. It should be expected from scientific principles that metal dicarboxylic salts would have different crystal structure (due to the absence of long-range ionic bonds) of the claimed invention than David's metal hydroxide. Therefore, it is not expected that David's oxide would have the instant invention's polygonal cross-section, as recited in claim 6.

Since neither David nor Wong teaches or suggests all of the elements of each of claim 6, neither David nor Wong render this claim obvious.

Claims 1-6, 30-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yukinobu or Yamamoto. Claims 1, 2, and 31 have been canceled. Therefore, the rejection of claims 1, 2, and 31 is now moot. The Applicants respectfully traverse the rejection of claims 3-6, 30, and 32 because Yukinobu or Yamamoto does not teach or suggest all of the limitations of each of claims 3-6, 30, and 32.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." "All words in a claim must be considered in judging the patentability of that claim against the prior art." MPEP § 2143.03 (8<sup>th</sup> Ed., Aug. 2001).

Yukinobu discloses aciculae having a major and a minor diameter (see; e.g., column 3, lines 4-6). Describing the cross section with two diameters, as Yukinobu does, shows that Yukinobu's aciculae are not polygonal. In fact, nowhere does Yukinobu teach or suggest a polygonal cross section, as recited in claims 3-6, 30, and 32.

In addition, contrary to the Examiner's assertion, Yukinobu's process is different than that of the instant invention. Therefore, it is not expected that Yukinobu's aciculae would have the same precipitated structure as the instant invention's acicular bodies. Yukinobu's process entails heating the mixture of indium ions and nitrate ions, optionally with indium hydroxide or alkali hydroxide, to supersaturation to precipitate indium hydroxide, which again forms with long-range ionic bonds. Column 3, lines 15-33. In contradistinction, the instant acicular bodies are made by reacting a metal salt with dicarboxylic acid ester far from saturation (note the small amounts of metals and ester relative to the amount of water in the examples of the instant specification). Yukinobu's precipitate is a hydroxide while the instant precipitate is metal dicarboxylic acid salt. The two compounds are expected to precipitate into different structures.

Similarly, nowhere does Yamamoto teach or suggest acicular bodies having a polygonal cross section, as is recited in claims 3-6, 30, and 32. For the same reason that Yamamoto's process is different than that of the present invention, and produces a different precipitate (monoamine complex of metal carbonate) than that of the present invention (metal dicarboxylic ester), Yamamoto's structure is not expected to be the same as the acicular bodies recited in claims 3-6, 30, and 32.

Claims 1-4 and 30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamaguchi. Claims 1 and 2 have been canceled. Therefore, the rejection as to claims 1 and 2 is now moot. The Applicants respectfully traverse the rejection as to claims 3, 4, and 30 because Yamaguchi does not teach or suggest all of the limitations of each of claims 3, 4, and 30.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." "All words in a claim must be considered in judging the patentability of that claim against the prior art." MPEP § 2143.03 (8<sup>th</sup> Ed., Aug. 2001). The need for specificity in the prior art pervades the authority of Section 103(a). If the prior art does not expressly teach or suggest the claimed invention, the Examiner must explain how such scant prior art can produce the claimed invention with all of its limitations. See; e.g., *In re Lee*, 61 U.S.P.Q.2d 1430, 1433-34 (Fed. Cir. 2002).

Yamaguchi teaches ultrafine particles of aluminum nitride or aggregates thereof, made by melting an aluminum alloy in a nitriding atmosphere. Column 2, lines 21, 41-42; column 4, lines 50-58. Nowhere does Yamaguchi teach or suggest acicular bodies of metal oxides, as recited in claims 3, 4, and 30. Moreover, Yamaguchi's whiskers are made by melting and solidifying an alloy, which has a certain crystal structure. The mere fact that aluminum nitride whiskers made from melting an alloy have a hexagonal cross section does not warrant the Examiner's assertion that acicular bodies of metal oxides have a polygonal cross section, as recited by claims 3, 4, and 30. *Connell v. Sears, Roebuck & Co.*, 220 U.S.P.Q. 193, 199 (Fed. Cir. 1983) ("That features, even distinguishing features, are 'disclosed' in the prior art is alone insufficient [to render the claimed invention obvious]."); *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 331 (Fed. Cir. 1983) ("[D]istilling an invention down to the 'gist' or 'thrust' of an invention disregards the requirement of analyzing the subject matter 'as a whole.' ").

Claims 1-6 and 30-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Japan 53025229. Claims 1, 2, and 31 have been canceled. Therefore, the rejection as to claims 1, 2 and 31 is now moot. The Applicants respectfully traverse the rejection as to claims 3-6, 30, and 32 because Japan 53025229 does not teach or suggest all of the limitations of each of claims 3-6, 30, and 32.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." "All words in a claim must be considered in judging the patentability of that claim against the prior art." MPEP § 2143.03 (8<sup>th</sup> Ed., Aug. 2001). The need for specificity in the prior art pervades the authority of Section 103(a). If the prior art does not expressly teach or suggest the claimed invention, the Examiner must explain how such scant prior art can produce the claimed invention with all of its limitations. *See; e.g., In re Lee*, 61 U.S.P.Q.2d 1430, 1433-34 (Fed. Cir. 2002).

The abstract of Japan 53025229 discloses metal fibers or inorganic whiskers with polygonal cross section. Merely disclosing general inorganic whiskers does not lead to a conclusion that metal oxide acicular bodies are taught or suggested. Inorganic materials encompass innumerable classes of chemical compounds, each of which surely has its own crystal structure that would determine the unique structure of the bodies grown naturally from solution containing the specific compound. Therefore, Japan 530225229 does not

fairly teach or suggest metal oxide acicular bodies having a polygonal cross section, as recited in claims 3-6, 30, and 32.

Since Japan 53025229 does not teach or suggest all of the limitations of each of claims 3-6, 30, and 32, Japan 53025229 does not render these claims obvious.

Since Yamaguchi does not teach or suggest metal oxide acicular bodies having a polygonal cross section, Yamaguchi does not render claims 3-6, 30, and 32 obvious.

In view of the above, it is submitted that the claims are patentable and in condition for allowance. Reconsideration of the rejection is requested. Allowance of claims at an early date is solicited.

Respectfully submitted,



---

Toan P. Vo, Ph.D.  
Attorney for the Applicants  
Registration No. 43,225  
(518)387-6648

Schenectady, New York  
**December 11, 2002**

**ATTACHMENT****VERSION OF CLAIMS WITH MARKINGS TO SHOW CHANGES MADE**

3. (Amended) The acicular body according to claims 32 having a cross-sectional dimension less than about 20  $\mu\text{m}$ .
4. (Twice amended) The acicular body according to claim 32 having a cross-sectional dimension less than about 10  $\mu\text{m}$ .
5. (Twice amended) An acicular body comprising at least one oxide of at least one metal selected from the group consisting of Groups [IB,] IIA, [IIB,] IIIA, IIIB, [IVA, IVB, VA, VB, VIA, VIB, VIIA, VIIB, OF VIIA] of the Periodic Table, rare earth metals, and mixtures thereof[,] said acicular body having a polygonal cross section and a cross-sectional dimension greater than about 1  $\mu\text{m}$ .
6. (Amended) An acicular body comprising at least one oxide of at least one metal selected from the group consisting of scandium, yttrium, lanthanum, aluminum, gallium, indium, thallium, cesium, praseodymium, neodymium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, and mixtures thereof; said acicular body having a polygonal cross section and a cross-sectional dimension greater than about 1  $\mu\text{m}$ .
30. (Amended) The acicular body according to claim 32 having a cross-sectional dimension less than about 5  $\mu\text{m}$ .
32. (Amended) (New) An acicular body comprising at least one oxide of a metal selected from the group consisting of Groups IB, IIA, IIB, IIIA, IIIB, IVA, IVB, VA, VB, VIA, VIB, VIIA, VIIB, [of] and VIIIA of the Periodic Table, rare earth metals, and mixtures thereof; said acicular body having a polygonal cross section and a cross-sectional dimension greater than about 1  $\mu\text{m}$ .